Digital ischaemia secondary to steal syndrome from a brachiocephalic arteriovenous fistula

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DESCRIPTION

A 68-year-old woman presented with a 6-month history of progressive dry gangrene of her left index and ring fingertips secondary to ischaemic steal syndrome (figure 1). She had end-stage renal failure (requiring dialysis through a left brachiocephalic arteriovenous fistula with a Thoratec stent created 12 months earlier), diabetes, hypertension, ischaemic heart disease and peripheral vascular

disease. Her symptoms began with reduced sensation and cold fingers, progressing to painful necrotic first and fourth fingertips, a cold hand and absent radial and ulnar pulses. Angiography revealed a high-flow fistula, distal antegrade flow and poor perfusion to the hand (figure 2). She underwent a Revascularisation Using Distal Inflow procedure which involved ligating the fistula at its origin and extending the inflow for the fistula

Figure 1 (A) Palmar view of the hand: digital ischaemia evidenced by cold, erythematous and oedematous fingers with dry gangrenous index and ring fingertips; (B) dorsal aspect of the hand showing dry gangrene of the index and ring fingertips.

Figure 2 Digital subtraction angiograms showing: (A) a widely patent high-flow brachiocephalic arteriovenous fistula with a Thoratec stent; (B) the bifurcation of the brachial artery with poor flow demonstrated distal to the fistula in the forearm; and (C) significantly diminished radial artery opacification into the hand, near absent ulnar artery supply, a poorly opacified palmar arch and metacarpal arteries, with no direct filling of the digital arteries.

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distally to the radial artery in the midforearm using a segment of the upper arm cephalic vein as the conduit, thus reducing flow in the fistula. At follow-up, the patient had a warm hand, strong radial pulse, improved pain and a patent, functioning fistula.

Steal syndrome, characterised by ischaemic symptoms (pain, paraesthesia and gangrene), is rare, occurring in <2% of radio-cephalic fistulas and 5–10% of brachiocephalic fistulas.¹ Physiological steal always occurs with an arteriovenous fistula.¹ Symptoms of steal syndrome arise from reduced inflow, outflow obstruction or lack of collateral supply.^{2–3} Risk factors include

diabetes, atherosclerosis, age >60 years and female gender.¹ Diagnosis is clinical, with signs including pallor, decreased/absent pulses, sensory and motor neuropathy, distal ulceration or necrosis.¹ Definitive management is surgical or endovascular, to reduce steal and improve distal flow.

Contributors DJTM was involved in patient care, preparing and submitting the manuscript. DC was the consultant in charge of the patient, performed the operation and reviewed the manuscript. AB performed the digital subtraction angiography and reviewed the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Learning points

- ▶ Ischaemic steal syndrome is a rare complication of arteriovenous fistula formation.
- ▶ Symptoms can be ameliorated surgically by ligating the fistula proximally and using distal inflow.

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